

AMENDMENTS TO THE CLAIMS

Claims 1-18 (Canceled)

Claim 19 (Original) An electrolytic processing apparatus comprising:

an electrode section including an electrode member comprised of an electrode and an ion exchanger covering a surface of the electrode;

a holder for holding a workpiece and bringing the workpiece into contact with the ion exchanger of the electrode member;

a liquid supply system for supplying a liquid between the ion exchanger and the workpiece held by the holder;

a drive mechanism for causing relative movement between the electrode section and the workpiece; and

a power source to be connected to the electrode of the electrode member of the electrode section;

wherein a continuous contact time of the ion exchanger with a point in a processing surface of the workpiece is not more than 10 msec.

Claim 20 (Original) The electrolytic processing apparatus according to claim 19, wherein the drive mechanism is designed to cause relative movement between the electrode section and the workpiece at a relative speed of not lower than 0.2 m/sec.

Claim 21 (Original) The electrolytic processing apparatus according to claim 19, wherein the ion exchanger covering the electrode is designed to make contact with the workpiece held by the holder with a contact width of 0.2 to 1.5 mm.

Claim 22 (Original) The electrolytic processing apparatus according to claim 21, wherein the drive mechanism is designed to cause relative movement between the electrode section and the workpiece at a relative speed of not lower than 0.2 m/sec.

Claims 23-38 (Canceled)

Claim 39 (Original) An electrolytic processing method comprising:

processing a workpiece in the presence of a liquid by applying a voltage to an electrode and moving an ion exchanger, covering a surface of the electrode, and the workpiece held by a holder relative to each other, while keeping the ion exchanger and the workpiece in contact with each other, such that the contact time of the ion exchanger with a point in a processing surface of the workpiece is not more than 10 msec.

Claim 40 (Original) The electrolytic processing method according to claim 39, wherein the ion exchanger and the workpiece held by the holder contact each other with a contact width of 0.2 to 1.5 mm.

Claim 41 (Original) The electrolytic processing method according to claim 39, wherein the ion exchanger and the workpiece held by the holder are moved relative to each other at a relative speed of not less than 0.2 m/sec while keeping them in linear contact with each other.

Claim 42 (Original) The electrolytic processing method according to claim 40, wherein the ion exchanger and the workpiece held by the holder are moved relative to each other at a relative speed of not less than 0.2 m/sec while keeping them in linear contact with each other.

Claims 43-71 (Canceled)

Claim 72 (New) An electrolytic processing apparatus comprising:

a processing electrode for processing a workpiece;
a feeding electrode for feeding electricity to the workpiece;
a power source for applying a voltage between the processing electrode and the feeding electrode;

a pressure tight container housing the processing electrode and the feeding electrode therein; and

a high-pressure liquid supply system for supplying a high-pressure liquid into the pressure tight container.

Claim 73 (New) The electrolytic processing apparatus according to claim 72, wherein a contact member is provided between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 74 (New) The electrolytic processing apparatus according to claim 73, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 75 (New) The electrolytic processing apparatus according to claim 73, wherein the pressure of the high-pressure liquid to be supplied into the pressure tight container is not lower than 2 kgf/cm².

Claim 76 (New) The electrolytic processing apparatus according to claim 73, wherein the high-pressure liquid supply system is provided with a heat exchanger for adjusting a temperature of the high-pressure liquid to be supplied into the pressure tight container.

Claim 77 (New) The electrolytic processing apparatus according to claim 72, further comprising:

- an electrode section including the feeding electrode and the processing electrode; and
- a contact member disposed between the electrode section and the workpiece and/or between the processing electrode and the feeding electrode of the electrode section.

Claim 78 (New) The electrolytic processing apparatus according to claim 77, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 79 (New) The electrolytic processing apparatus according to claim 77, wherein the pressure of the high-pressure liquid to be supplied into the pressure tight container is not lower than 2 kgf/cm².

Claim 80 (New) The electrolytic processing apparatus according to claim 77, wherein the high-pressure liquid supply system is provided with a heat exchanger for adjusting a temperature of the high-pressure liquid to be supplied into the pressure tight container.

Claim 81 (New) The electrolytic processing apparatus according to claim 72, wherein the high-pressure liquid supply system is provided with a heat exchanger for adjusting a temperature of the high-pressure liquid to be supplied into the pressure tight container.

Claim 82 (New) The electrolytic processing apparatus according to claim 72, wherein the high-pressure liquid supply system is provided with a degassing device for releasing dissolved gas from the high-pressure liquid to be supplied into the pressure tight container.

Claim 83 (New) An electrolytic processing apparatus comprising:

- a processing electrode for processing a workpiece;
- a feeding electrode for feeding electricity to the workpiece;
- a power source for applying a voltage between the processing electrode and the feeding electrode; and
- a liquid supply system for supplying a liquid between the workpiece and at least one of the processing electrode and the feeding electrode;
- wherein the liquid supply system is provided with a heat exchanger for adjusting a temperature of the liquid to be supplied between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 84 (New) The electrolytic processing apparatus according to claim 83, wherein a contact

member is provided between the processing electrode and the workpiece.

Claim 85 (New) The electrolytic processing apparatus according to claim 84, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 86 (New) The electrolytic processing apparatus according to claim 84, wherein the heat exchanger adjusts the liquid to be supplied between the workpiece and the contact member so that a liquid temperature becomes not more than 25°C.

Claim 87 (New) The electrolytic processing apparatus according to claim 83, further comprising:
an electrode section including the feeding electrode and the processing; and
a contact member disposed between the electrode section and the workpiece and/or between the processing electrode and the feeding electrode of the electrode section.

Claim 88 (New) The electrolytic processing apparatus according to claim 87, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 89 (New) The electrolytic processing apparatus according to claim 87, wherein the heat exchanger adjusts the liquid to be supplied between the workpiece and the contact member so that a liquid temperature becomes not more than 25°C.

Claim 90 (New) An electrolytic processing apparatus comprising:
an electrode section including an electrode member comprised of an electrode;
a liquid supply system for supplying a liquid between the electrode and a workpiece;
a drive mechanism for causing relative movement between the electrode section and the workpiece; and
a power source to be connected to the electrode of the electrode member of the electrode section;

wherein an on/off or positive/negative control of the power source is performed in synchronization with the relative movement between the electrode section and the workpiece.

Claim 91 (New) The electrolytic processing apparatus according to claim 133, wherein the on/off control is performed such that the power source is on when the relative speed between the electrode of the electrode section and the workpiece in the width direction of the electrode section is not lower than 0.2 m/sec.

Claim 92 (New) An electrolytic processing method comprising:

processing a workpiece in the presence of a high-pressure liquid by applying a voltage to an electrode section.

Claim 93 (New) The electrolytic processing method according to claim 92, wherein the high-pressure liquid is supplied between the electrode section and the workpiece.

Claim 94 (New) The electrolytic processing method according to claim 92, wherein the workpiece is processed by immersing the workpiece and the electrode section in the high-pressure liquid.

Claim 95 (New) The electrolytic processing method according to claim 92, wherein the electrode section includes a processing electrode for processing the workpiece and a feeding electrode for feeding electricity to the workpiece.

Claim 96 (New) The electrolytic processing method according to claim 92, wherein a pressure of the high-pressure liquid is not lower than 2 kgf/cm².

Claim 97 (New) The electrolytic processing method according to claim 95, wherein a contact member is provided between the workpiece and at least one of the processing electrode and the

feeding electrode.

Claim 98 (New) The electrolytic processing method according to claim 97, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 99 (New) An electrolytic processing method comprising:

processing a workpiece in the presence of a high-pressure liquid by applying a voltage to an electrode section;

wherein the electrode section includes a processing electrode for processing the workpiece and a feeding electrode for feeding electricity to the workpiece.

Claim 100 (New) The electrolytic processing method according to claim 99, wherein a contact member is provided between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 101 (New) The electrolytic processing method according to claim 100, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 102 (New) An electrolytic processing method comprising:

providing a processing electrode which can come close to or into contact with a workpiece, and a feeding electrode for feeding electricity to the workpiece; and

processing the workpiece by applying a voltage between the processing electrode and the feeding electrode while supplying a liquid at an adjusted temperature between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 103 (New) The electrolytic processing method according to claim 102, wherein an ion exchanger is provided between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 104 (New) An electrolytic processing method comprising:

providing a processing electrode which can come close to or into contact with a workpiece, and a feeding electrode for feeding electricity to the workpiece; and

processing the workpiece by applying a voltage between the processing electrode and the feeding electrode while supplying a degassed liquid between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 105 (New) The electrolytic processing method according to claim 104, wherein an ion exchanger is provided between the workpiece and at least one of the processing electrode and the feeding electrode.

Claim 106 (New) An electrolytic processing method comprising:

processing a workpiece in the presence of a liquid by applying a voltage to a plurality of electrodes and moving the electrodes and the workpiece relative to each other;

wherein the voltage is on/off or positive/negative controlled in synchronization with the relative movement.

Claim 107 (New) The electrolytic processing method according to claim 134, wherein the liquid is pure water, ultrapure water, or a liquid having an electric conductivity of not more than 500 $\mu\text{s}/\text{cm}$.

Claim 108 (New) An electrolytic processing method comprising:

bringing a workpiece and a processing electrode close to or into contact with each other; and

processing the workpiece in the presence of a liquid by applying a voltage between the workpiece and the processing electrode while moving the workpiece and the processing electrode relative to each other;

wherein the relative speed between the workpiece and the processing electrode is made fast in an initial processing stage and slow in a later processing stage.

Claim 109 (New) The electrolytic processing method according to claim 108, wherein the relative speed between the workpiece and the processing electrode is made slow when a thickness of a film, which is formed in a processing surface of the workpiece and is being processed, has reached a value of not more than 600 nm.

Claim 110 (New) The electrolytic processing method according to claim 108, wherein the relative speed between the workpiece and the processing electrode is changed stepwise.

Claim 111 (New) The electrolytic processing method according to claim 108, wherein the relative speed between the workpiece and the processing electrode is changed continuously.

Claim 112 (New) The electrolytic processing method according to claim 108, wherein a contact member is provided between the workpiece and the processing electrode.

Claim 113 (New) The electrolytic processing method according to claim 112, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 114 (New) The electrolytic processing method according to claim 108, further comprising:

providing a feeding electrode for feeding electricity to the workpiece; and
disposing a contact member between the feeding electrode and the workpiece.

Claim 115 (New) The electrolytic processing method according to claim 114, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 116 (New) An electrolytic processing method comprising:

bringing a workpiece and a processing electrode close to or into contact with each other;
and

processing the workpiece in the presence of a liquid by applying a voltage between the workpiece and the processing electrode while moving the workpiece and the processing electrode relative to each other;

wherein the relative speed between the workpiece and the processing electrode is made fast in an initial processing stage, slow in an intermediate processing stage, and faster in a later processing stage than the intermediate processing stage.

Claim 117 (New) The electrolytic processing method according to claim 116, wherein the relative speed between the workpiece and the processing electrode is made slow when a thickness of a film, which is formed in a processing surface of the workpiece and is being processed, has reached a value of not more than 600 nm, and the relative speed between the workpiece and the processing electrode is made again fast when a thickness of the film has reached a value of 50 to 300 nm.

Claim 118 (New) The electrolytic processing method according to claim 116, wherein the relative speed between the workpiece and the processing electrode is changed stepwise.

Claim 119 (New) The electrolytic processing method according to claim 116, wherein the relative speed between the workpiece and the processing electrode is changed continuously.

Claim 120 (New) The electrolytic processing method according to claim 116, further comprising:

disposing a contact member between the workpiece and the processing electrode.

Claim 121 (New) The electrolytic processing method according to claim 120, wherein the

contact member comprises an ion exchanger or a polishing pad.

Claim 122 (New) The electrolytic processing method according to claim 116, further comprising:

providing a feeding electrode for feeding electricity to the workpiece; and
disposing a contact member between the feeding electrode and the workpiece.

Claim 123 (New) The electrolytic processing method according to claim 122, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 124 (New) An electrolytic processing method comprising:

bringing a workpiece and a processing electrode close to or into contact with each other;
and

processing the workpiece in the presence of a liquid by applying a voltage between the workpiece and the processing electrode while moving the workpiece and the processing electrode relative to each other;

wherein the relative speed between the workpiece and the processing electrode is made slow in an initial processing stage and fast in a later processing stage.

Claim 125 (New) The electrolytic processing method according to claim 124, wherein the relative speed between the workpiece and the processing electrode is made fast when a thickness of a film, which is formed in a processing surface of the workpiece and is being processed, has reached a value of 50 to 300 nm.

Claim 126 (New) The electrolytic processing method according to claim 124, wherein the relative speed between the workpiece and the processing electrode is changed stepwise.

Claim 127 (New) The electrolytic processing method according to claim 124, wherein the

relative speed between the workpiece and the processing electrode is changed continuously.

Claim 128 (New) The electrolytic processing method according to claim 124, further comprising:

disposing a contact member between the workpiece and the processing electrode.

Claim 129 (New) The electrolytic processing method according to claim 128, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 130 (New) The electrolytic processing method according to claim 124, further comprising:

providing a feeding electrode for feeding electricity to the workpiece; and

disposing a contact member between the feeding electrode and the workpiece.

Claim 131 (New) The electrolytic processing method according to claim 130, wherein the contact member comprises an ion exchanger or a polishing pad.

Claim 132 (New) An electrolytic processing method comprising:

bringing a workpiece and a processing electrode close to or into contact with each other; and

processing the workpiece in the presence of a liquid by applying a voltage between the workpiece and the processing electrode while causing relative movement between the workpiece and the processing electrode by allowing the workpiece and/or the processing electrode to make a cyclic movement;

wherein the cycle of the cyclic movement of the workpiece and/or the processing electrode is changed during processing.

Claim 133 (New) The electrolytic processing method according to claim 90, further comprising:

an ion exchanger covering a surface of the electrode; and
a holder for holding a workpiece and bringing the workpiece into contact with the ion exchanger of the electrode member.

Claim 134 (New) The electrolytic processing method according to claim 106, further comprising:

an ion exchanger covering the surfaces of the plurality of electrodes; and
a holder for holding the workpiece and bringing the workpiece into contact with the ion exchanger of the electrodes.